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PRELIMINARY DOWELS ¹

ON many of the plinth blocks of the south wall of the cella of the Parthenon, I observed some time ago the existence of a rather large cavity at the bottom of one end joint of each stone; this cavity is more or less regularly hewn, and, owing to its position,² cannot be the result of the work of robbers searching for the lead sealing of clamps and dowels. Failing to discover, among treatises dealing particularly with the Parthenon, any interpretation of these cavities, I judged that an attempt to solve the problem would not be without advantage.

Examination of a number of these cavities reveals two facts: (1) they are always found at the undowelled end joints of the blocks, and (2) under each cavity, on the upper surface of the block lying below it, is always found a triangular hole, tooled like a pry hole, in which usually remain rusted traces and bits of iron, not fastened by lead.³ From this association between the cavity and the triangu-

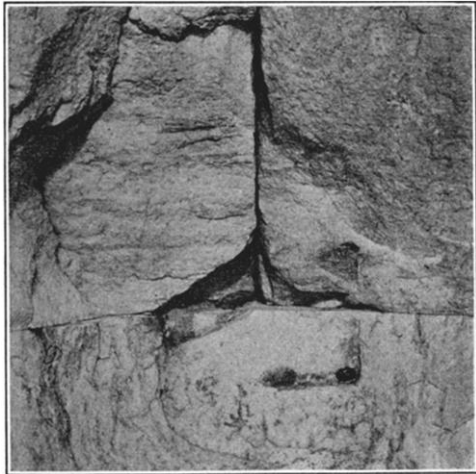


FIGURE 1.—HOLE FOR PRELIMINARY DOWEL
(Photograph)

¹ I am indebted to Mr. W. B. Dinsmoor who kindly assisted me in the translation of this paper.

² It is always situated farther from the wall face than the dowel.

³ These triangular holes are interpreted by Mr. Stevens (in Fowler and Wheeler, *Handbook of Greek Archaeology*, p. 104, n. 1) as pry holes; he supposes that the pieces of iron in them were used "to give the crow-bar a solid hold in prying."

lar hole, we must understand that there was some intimate relation between them. In the hole was placed an iron object which was shielded or protected by the hollowed cavity.

Exactly what was placed here, I learned only quite recently, when, by means of the scaffolding constructed for the consolidation of the walls decorated with the Byzantine paintings, I was able to examine also the upper courses of blocks. In one of the plinth blocks near the southwest corner was found again the above-mentioned cavity, and within this a bar of iron, placed obliquely in the corner formed by the lower block (A) and that (B) which adjoins the block (C) containing the cavity (Fig. 2). The iron of this bar is very badly preserved.

The bar has a length of about 0.11 m. and a rectangular section (0.02×0.03 m.). Against plinth B the bar simply leans, while it is sunk in plinth A by means of the triangular hole, which was described above. Two similar bars, very well preserved, one now in the workshop in the Pinakotheke, the other in the magazine of the Acropolis Museum, are known to have come from the Parthenon. The former I had observed long before, but was then unable to explain the oblique

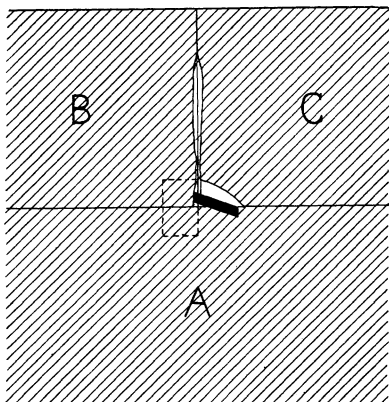


FIGURE 2.—PRELIMINARY DOWEL
(Drawing)

cutting of its ends; after the recent discovery, however, the purpose for which this was intended is quite evident.

The form of the bar, the manner in which it was braced between the two plinths A and B, and the form of the triangular hole on plinth A, all give evidence as to the function performed by this bar. Leaning against the same joint surface in which the dowels were placed, it served as a brace against horizontal sliding before the succeeding blocks were laid, and kept the joint tightly closed. These bars were doubtless placed before the dowels were set, but they were afterwards left, curiously enough, in their positions, for we find them even now. And since such a protruding bar would have obstructed the placing of the next block in the series,

the latter was partly cut away, leaving a cavity (C) which would surround the bar (cf. Fig. 2).

A new stage in the work of construction is now added to those previously known, namely, the bracing of the stones before they were dowelled. In the preserved building inscriptions, unfortunately, no mention of such work occurs. The name which was applied to the sloping pieces of iron now discovered is, therefore, lacking. In a Delian inscription¹ are mentioned *περίγομοι*, which would be a convenient name for them; but there they appear in the ceiling construction, and were evidently of a different material and served a different purpose. For the present, therefore, they may be termed, because of their function, preliminary dowels.

The need of these bars does not seem very urgent when it is a case of horizontal courses, since their purpose would be fulfilled also by the dowels, after the latter were once in position. These preliminary or auxiliary dowels were applied, however, to all the stones of the Parthenon. Their use, on the other hand, appears very necessary when it is a case of sloping blocks, as, for instance, raking geisa. And, that such braces were actually employed in the latter case, we learn from a bit of iron still existing in a hole beside the dowel for a raking geison, on the northernmost orthostate of the east tympanum of the Propylaea.² This bit of iron is doubtless part of a preliminary dowel, which here would have been useful, owing to the tendency of the geison to slide before it was dowelled.

Preliminary dowels were employed, therefore, not only in the Parthenon, but also in the Propylaea; on the other hand, they are not found in the Erechtheum or in the Temple of Athena Nike. We must not, however, regard them as an invention of the Periclean period, for a much earlier use of them is proved by the existence of the cavities and holes for them on the stylobates of the older temple of Dionysus and of the Peisistratid peristyle of the Hekatompedon,³ near the Porch of the Maidens. The triangular holes in the latter are so large that it is only reasonable to suppose that the preliminary dowels in the Hekatompedon were made of wood; the holes contain no traces of iron.⁴ Here,

¹ *B.C.H.* XXIX, 1905, p. 460.

² *A.J.A.* XIV, 1910, pl. IV.

³ *Antike Denkmäler*, I, Taf. 1.

⁴ Similar wooden braces are sometimes used also in work of the present day, but they are taken out before the succeeding blocks are laid.

moreover, the preliminary dowels must have acted also as proper dowels, the latter being absent.

As preliminary dowels do not occur in later buildings, it seems very probable that they were used only during the sixth and fifth centuries B.C.

ANASTASIOS C. ORLANDOS.

ATHENS, 1914.